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WAVE 2
National Income Dynamics
Study (NIDS) – Coronavirus
Rapid Mobile Survey (CRAM)

Differences between formal and informal workers' outcomes during the COVID-19 crisis lockdown in South Africa

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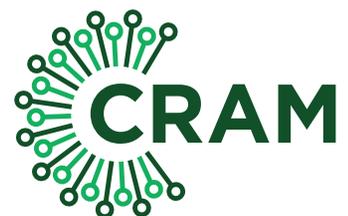# Differences between formal and informal workers' outcomes during the COVID-19 crisis lockdown in South Africa

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Abstract

Many governments around the world have responded to the COVID-19 pandemic through a suite of social distancing measures (lockdown). However, this has had unintended consequences on labour markets, with informal workers disproportionately affected. South Africa's lockdowns commenced with stringent directives (level 5) some of which were chronologically relaxed in subsequent lockdowns (level 4 to level 2). This paper explores changes in labour market outcomes (wages and hours worked) of formal/informal workers in South Africa, between April (lockdown level 5) and June (lockdown level 3). We employ a DID estimator and data from the first 2 waves of NIDS-CRAM data. Our results show a wage decrease of the same order for both formal and informal workers. Across subgroups, wages decreased more for men and urban workers who are informally employed, relative to their formally employed counterparts. We also find higher decreases in hours worked among men and women in informal work relative to those in formal work. This is also the case for informal workers in urban areas. Based on these results, we recommend for government interventions that set all workers on a recovery path. These can be targeted at enabling recovery of time spent at work which in turn boost productivity and wages. The government also needs to consider extending coverage of social relief to informal workers, as well as stabilise the broader economy for informal sector enterprises to thrive.

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Executive summary

The COVID-19 pandemic is the worst global crisis since World War II. Its containment measures (lockdown) have caused unprecedented disruption on economies and labour markets. Many countries imposed stringent lockdown regulations which halted most economic activities and transmitted an unignorable demand and supply shock to the economy. This triggered massive job losses, a decline in earnings and hours of work, and increasing relative levels of poverty. Informal workers in South Africa and the world over bore a disproportionate burden of these social distancing measures. This stems from their jobs being characterised by precarious working conditions, day-to-day earnings and absence of legal and social protections. Consequently, any break in economic activity has an instantaneous effect on earnings and employment. The loss in livelihoods has partly prompted governments to ease lockdown restrictions and allow more workers to return to work, under a directive to observe strict health protocols and social distancing rules.

Using data from Waves 1 and 2 of NIDS-CRAM, this paper investigates whether formal and informal workers in South Africa had different recovery experiences in hours worked and real hourly wages as the country's lockdown regulations eased from level 5 (April) to level 3 (June). Informal workers are identified as regular and casual workers who do not have an employment contract, and unregulated own account workers and employers. Results based on a Difference in Differences (DID) estimation method show wage losses that were statistically similar for informal and formal workers. Disaggregating by sex, we find that wages for informally employed men declined by 72% more than the decline experienced by formally employed men. Informal workers in urban areas also experienced a higher decline in wages (81%) compared to that experienced by urban workers in formal employment. Further, we find significantly higher decreases in hours worked among men and women in informal work relative to those in formal work. Informal workers in urban areas were more vulnerable when compared to those in rural areas. Other results also show that the rate of job loss was higher among informal (36%) compared to formal workers (11%).

Our results suggest that there is a need for government interventions that set all workers on a recovery path. Policies to improve wages for informal workers need to be sensitive to the heterogeneity characterising these workers. There is also a need for strategies that enable recovery of time spent at work which in turn boost productivity and wages. Social safety nets to cushion informal workers from the loss of income associated with a disproportionate decline in income and job loss are also required. Noting the value chain linkage between formal and informal economies, concerted efforts from the government and its partners to stabilise the broader economy are essential so that informal enterprises can thrive. However, our estimates of changes in wages and hours worked are potentially underestimated given the limitations of our data.

1.   Introduction

The COVID-19 pandemic is the worst global crisis since World War II. Its containment measures (lockdown) have caused unprecedented disruption on economies and labour markets (ILO, 2020). During the first quarter of 2020, many countries imposed stringent lockdown regulations which stopped most economic activities and transmitted an unignorable demand and supply shock to the economy (Kesar et al., 2020). The associated change and deterioration of economic conditions triggered massive job losses, a decline in earnings and hours of work, and increasing levels of poverty (ILO, 2020). Most of the vulnerable workers in South Africa and the world over participate in the informal rather than the formal economy. For example, during the first month of the crisis, the earnings of about 1.6 billion informal workers declined by 60 percent globally (ILO, 2020). This decline was even worse in Africa and Latin America, at 80 percent. The vulnerability of informal workers derives from their jobs being characterised by precarious working conditions, day-to-day earnings and absence of legal and social protections (ILO, 2020; Kesar et al., 2020; Rogan and Skinner, 2020). Consequently, any break in economic activity has an instantaneous effect on earnings and employment (Kesar et al., 2020).

Since the World Health Organisation declared COVID-19 a global pandemic on 11 March 2020, the South African government has been imposing containment measures. The Department of Cooperative Governance and Traditional Affairs (COGTA) has been issuing a battery of regulations which include: full lockdown – level 5 (imposed from 27 March - 30 April), followed by high restrictions - level 4 (from 1 -30 May), moderate restrictions - level 3 (from 1 June -17 August), and the ongoing less moderate restrictions - level 2 (introduced on 18 August). With each successive level, the government has opened up more sectors of the economy which has allowed more individuals to work. This could have set labour market outcomes of South African workers on a recovery path, which raises the question whether formal and informal workers had different recovery experiences. This follows as the South African government's economic relief measures to workers have gaps in provision (Rogan and Skinner, 2020). More information is, however, required to characterise shifts in the negative effects of the pandemic on informal workers, to inform policy responses amidst the pandemic.

Using data from the South African National Income Dynamics Study Coronavirus Rapid Mobile Survey (NIDS-CRAM), this paper aims to identify differences between formal and informal workers' outcomes as the lockdown regulations eased from level 5 to level 3. Specific focus is given to differences in changes between real hourly wages, and hours worked/week among formal and informal workers, from April to June 2020. The analysis exploits data from Wave 1 (collected in May and June) and Wave 2 (collected in July and August) of the NIDS-CRAM survey conducted by the Southern Africa Labour and Development Research Unit (SALDRU) based at UCT's School of Economics. The study utilises the Difference in differences (DID) estimation method for analyses.

The rest of the paper is structured as follows. Section 2 contextualises the study, section 3 discusses data and methodology, section 4 discusses the results and concludes

2.   Background and Context

The informal economy is more of a permanent feature of labour markets in developing countries such as in Africa and in Latin America. It employs 86 percent of workers in Africa (ILO, 2018), hence a study of African labour markets would be incomplete without the informal economy. However, the informal economy in South Africa employs about a third of the country's workforce which is small by developing country standards (Rogan and Skinner, 2020; Bassier et al., 2020). This is difficult to comprehend given high levels of unemployment in the country. The unemployment rate stood between 30 and 40 percent during the first quarter of 2020 (Statistics South Africa, 2020). The small size of the informal economy is partly attributed to high barriers to entry and high reservation wages among the unemployed (Kindgon and Knight, 2001). Regardless, the need to cushion informal workers and their households from negative effects of the pandemic motivates for an analysis of the sector.

A long standing empirical regularity in the literature is that informal workers incur a wage penalty when compared to formal workers (Badaoui et al., 2008, Bargain and Kwenda, 2014). This penalty can be explained by the labour market segmentation theory. The dual labour market hypothesis suggests that the labour market is apportioned into two segments, the primary (formal) and the secondary (informal) sector. Workers are randomly 'assigned' between sectors and there are barriers to entry in the primary sector. The primary sector has good working conditions, secure jobs and pays higher wages whereas the secondary sector has indecent jobs, poor working conditions and low remuneration. Therefore workers 'assigned' to the secondary (informal) sector experience a wage penalty compared to their equally productive counterparts in the primary (formal) sector (Doeringer and Piore, 1971). A wage penalty for informal sector employment may also arise as individuals sort themselves across sectors. Individuals with low levels of human capital are more likely to self-select into the informal sector. This is possible as informal sector enterprises with limited access to finance tend to recruit less able workers (Amaral and Quintin 2006; Badaoui et al., 2008).

Labour market regulations in the formal sector, such as minimum wages and labour unions, also provide rationale for an informal sector wage penalty. These exert upward pressure on formal sector wages above market clearing wages, though at a cost of fuelling unemployment (Bargain and Kwenda, 2014). However, there are contrasting theories which maintain that in a few select contexts informal sector workers are instead paid more than formal sector workers. This line of thought is, nonetheless, beyond the scope of our work given labour market effects of the global pandemic.

Within the context of the COVID-19 pandemic, a small but rapidly growing number of studies have been conducted to evaluate the effect of lockdown regulations on labour market outcomes, inter alia. Rogan and Skinner (2020) showed that informal workers in South Africa were affected by the global crisis more than their formal counterparts. For instance, they showed that 31 percent of informal workers who retained their livelihoods were 'locked out' of employment in April compared to 26 percent of those in formal employment. Also, average earnings decreased by 27 percent while typical earnings decreased by 60 percent for those who were informally self-employed in February and April. The devastating effects of COVID-19 containment measures on the informal workers were also confirmed in other developing countries such as India, Burkina Faso, Mali and Senegal.

Stringent lockdown regulations were imposed in India from March 24 to May 31, 2020. Kesar et al. (2020) investigated the impact of the lockdown on employment, livelihoods, food security and access to relief measures. Results showed that two-thirds of the respondents lost work. Informal sector workers who retained their jobs experienced an earnings reduction of more than 50 percent, while 50 percent of regular paid workers received no salary or a reduction in salaries. There were also large increases in food insecurity (among 80 percent of the households), depletion of savings and patchy coverage of relief measures. Balde et al. (2020) also showed that informal sector workers in Burkina Faso, Mali and Senegal were more likely to experience a decrease in earnings than formal sector workers. These results have prompted this paper to complement the descriptive analysis in Rogan and Skinner (2020) by carrying out an econometric analysis of the impact of COVID-19 on formal and informal workers as lockdown regulations in South Africa eased from level 5 to level 3.

Potential effects of COVID-19 regulations on Informal workers

The lockdown measures imposed by the South African government to contain COVID-19 were phased into 5 levels, with level 5 being the most restrictive and level 1 being the least restrictive. The country went into level 5 lockdown in March-April 2020. This was characterised by extremely strict precautionary directives by the government, which entailed closure of all economic sectors except for essential services. All non-essential sector workers were ordered to stay at home and work from there where possible. Individuals were only allowed to leave their residences when obtaining an essential good or service, collecting a social grant or seeking emergency, lifesaving,

or chronic medication (COGTA, 2020a,b). Apart from informal workers who provide essential goods and services, these regulations meant a loss in livelihoods for informal workers, especially those who rely on day-to-day earnings. In contrast, formal workers, although they did not go to work, their rate of vulnerability to income loss was arguably lower given that they are cushioned by various contractual agreements. Thus, level 5 regulations could have exerted a disproportionate shock on informal workers' livelihoods. Although important to acknowledge is that NIDS-CRAM Wave 1 was not able to identify how many of the 3 million lost jobs were informal.

The country moved to lockdown level 4 from 1-30 May. While more economic activity was allowed, the government issued strict health protocols and social distancing rules and employers were directed to enable employees to work from home or minimise physical contact. More informal workers could now work, including those in agriculture, hunting forestry and fishing; manufacturing of clothing, footwear, bedding and all winter products; wholesale and retail trade, spaza shops and informal traders; informal recyclers; and live in staff in private households, and those caring for the sick, elderly and disabled (COGTA, 2020c).

Moderate restrictions were introduced during lockdown level 3 which lasted from June to August 2020. These upheld strict compliance with health protocols, such as wearing face masks in public, and social distancing measures. Most workers were permitted to work away from home and the workplaces were directed to follow protocols of being COVID-19 ready. Work restrictions were, however, still in place for those employed in public spaces such as gyms and fitness centres; night clubs, fêtes and bazaars; traders of onsite liquor consumption and shebeens; traders of food and beverages for onsite consumption; hotels, lodges, bed and breakfasts, and conference facilities (COGTA, 2020d). Given the differences in the nature of work in formal and informal economies, it is anticipated that the move to level 3 potentially had a different effect on formal and informal workers.

Informal workers and emergency social relief for COVID-19

Informal workers in South Africa mostly live in poor households which highlights the importance of cushioning them from the labour market effects of COVID-19 (Bassier et al., 2020). In April, the South African government unveiled a social relief and economic support package of R500 billion (The Presidency, 2020). This was to be used to assist businesses to pay salaries i.e. Temporary Employer/ Employee Relief (TERS), pay direct social benefits to citizens and avail funding to small businesses, including spaza shops and the informal economy, affected by lockdown (Khambule, 2020; Rogan and Skinner, 2020). However, the initial TERS was focussed on UIF-registered businesses and workers which excluded informal workers. This was later extended to workers who are not registered for UIF of which informal workers are a subset (Rogan and Skinner, 2020).

As for direct social benefits, the government increased the old age and child support grants and introduced a R350 grant for unemployed people, who are not beneficiaries of any other government scheme. Thus, informal workers were not a direct target of the cash transfers, but could indirectly benefit in the event of unemployment or through co-residence with beneficiaries (Bassier et al., 2020). For small business support, although it is available for informal enterprises, uptake is restricted or delayed due to registration requirements akin to those for formal businesses (e.g. having a bank account and registering for tax and UIF). Taken together, this analysis shows that the informal economy still needs directly targeted measures in order to benefit more from the social relief fund. This also supports measures that foster a non-delayed recovery of informal workers' labour market outcomes. For a more detailed analysis of how government support measures for COVID-19 improperly targeted informal workers, see Rogan and Skinner, 2020.

3. Methodology and Data

3.1. Methodology

In this study we estimate changes in labour market outcomes in South Africa during the COVID-19 lockdown period. South Africa responded to the COVID-19 pandemic by stipulating a 5-tiered lockdown in a bid to prevent the spread of coronavirus. Level 5 has the most stringent social distancing measures while level 1 has the least. For this analysis, particular attention is paid to lockdown levels 3 and 5. As discussed above, the government directives under level 5 (March-April 2020) saw closure of all sectors except essential services and stipulated that non-essential workers should work from home. Informal workers were more likely to have experienced a higher shock to their source of livelihood, due to a high degree of inability to work from home, inter alia. The lockdown regulations on economic participation were less stringent during level 3 (June-July 2020). A number of business were re-opened and both informal and formal sector workers could return to work. The move to level 3 potentially saw some recovery in labour market outcomes for workers in both sectors, albeit at varying degrees.

Against this background, this study is interested in understanding the changes that occurred in labour market outcomes of informal relative to formal workers to inform policy. To estimate these changes, we consider informal workers as the treatment group (i.e. more vulnerable to shocks and having lower recovery prospects) while formal workers are the control group (cushioned by contractual agreements). The analysis is done over two periods; April 2020 when the economy was under lock down level 5 (before period) and June 2020 when the economy was re-opened under lock down level 3 (post period). In identifying the effects of interest, our analysis faces a problem of selection into type of employment. This potentially stems from omitted unobserved heterogeneity (e.g. productivity) that may be correlated with both choice of work and labour market outcomes. To circumvent this problem, we employ a difference in differences (DID) estimator which eliminates any permanent differences in the outcomes of formal and informal workers as well as time trends inherent in the outcomes under consideration. Accordingly, we estimate the following regression:

$$\log(y_{it}) = \alpha + \beta x_{it} + \rho I_{it} + \theta post_{it} + \gamma(post_{it} \times I_{it}) + \varepsilon_{it} \qquad (1)$$

Where y_{it} denotes the labour market outcomes for person i at time t (i.e. hourly wage, hours worked per week); x_{it} is a vector capturing individual observed characteristics (age, sex, race education, urban and provincial dummies); I_{it} is a binary variable which is equal to 1 if an individual is informally employed at time t and zero otherwise; $post_{it}$ is an indicator variable taking the value of 1 if the observation is for June 2020 (lockdown level 3) and 0 if observation is for April 2020 (lockdown level 5); α, β, ρ, θ and γ are parameters to be estimated. The coefficient of interest γ captures the changes that occurred among informal workers between April and June 2020 relative to changes experienced among formal workers. A positive and statistically significant coefficient suggests an improvement in the outcome of informal relative to formal workers while a negative coefficient indicates a deterioration.

A limitation of the DID estimator is that it exploits information of all observations in the sample. However, it is possible that informal workers could be considerably different from formal workers (selection). This might generate lack of common support (i.e. limited overlap in characteristics of informal and formal workers) resulting in biased estimates. Ideally, this limitation can be accounted for by using a DID estimator combined with propensity score matching (DID-PSM). Unfortunately, we are unable to exploit this approach due to sample size issues, particularly when analysing subgroups. We therefore acknowledge this limitation. To ensure that our estimates are nationally representative, all models are weighted using the panel weights provided in the data. We compute robust and clustered standard errors to account for heteroscedasticity and serial correlation.

3.2. Data and Descriptive Statistics

We use data drawn from wave 1 and wave 2 of the 2020 NIDS-CRAM survey. The survey is based on telephonic interviews, about 7,000 individuals were interviewed for wave 1 (from May to June) and

about 5,600 for wave 2 (from July to August). NIDS-CRAM is nationally representative which allows for a comprehensive analysis of the effects of the COVID-19 pandemic on South African workers and their households. The NIDS-CRAM survey is designed with a panel structure; individuals surveyed in wave 1 were re-surveyed in wave 2. The survey collects information on a wide range of individual and household characteristics (e.g. demographics, labour market status, education and location) which are useful for this study.

We construct the panel by linking individuals in waves 1 and 2 using a unique person identifier provided in the data. Of the initial 7 073 individuals surveyed in wave 1, 5676 individuals (80%) were re-surveyed in wave 2. For our purposes of exploring labour market outcomes of informal/formal workers we clean this tracked sample as follows: First, we drop 758 individuals who are above 60 years old; 2 867 individuals who are not employed in wave 1; 110 individuals with missing information on employment status and those who become economically inactive in wave 2.

Informal workers are identified as regular and casual workers without a written employment contract and own account workers/employers who are not registered for income/value-added tax. We drop 295 workers who move between formal and informal employment and 52 individuals with missing information on province. This data cleaning process leaves a sample with 1594 individuals (3188 observations) for our analysis.

To generate our key labour market outcome variables (i.e. hourly wages and hours worked/week), we use individual responses to questions on the average number of hours (days) worked in a day (week) in April for wave 1 and June for wave 2. Wages and hours worked per week of individuals who become unemployed are set to zero in wave 2. The survey requested individuals to report if they were paid daily, weekly, fortnightly or monthly and earnings could be reported in point values or brackets. Those who responded in income brackets were assigned the median value of point values reported within the bracket. We adjust the earnings with frequency of payment to reflect monthly earnings, and these were deflated to July 2020 values using the monthly CPI deflator. The hourly wage is obtained by diving monthly earnings by the number of hours worked per month[3]. To ensure that workers who lose jobs in wave 2 (i.e. zero wages) are included in the analysis, our log of wage is computed as follows: log (wage+1) and similarly for hours worked log (hours+1). *Table 1* presents descriptive statistics of individual labour market outcomes by type of employment for our baseline sample.

Table 1: Worker classification and outcomes

	Overall			Formal			Informal		
	N	Mean / Prop.	Median	N	Mean / Prop.	Median	N	Mean / Prop.	Median
	3,188	1.000		2,090	0.699		1,098	0.301	
Log wage*	2,607	3.007	3.267	1,509	3.376	3.593	726	2.061	2.470
		{1.803}			{1.724}			{0.796}	
		(0.038)			(0.044)			(0.035)	
Log hours‡	2,598	3.087	3.714	1,510	3.336	3.714	717	2.437	3.091
		{1.326}			{1.091}			{1.626}	
		(0.028)			(0.028)			(0.061)	

Notes:
1. N is unweighted. All statistics are weighted. Standard deviation in curled brackets and standard error of mean in round brackets.
**2.** ‡Log hours/week = (average hours worked/day days worked/week) + 1]. *Log hourly wage = log (hourly wage+1)

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3   Hours worked per month are derived as average hours worked per day *average days worked per week 4.

Statistics show that 30.1% of workers were informally employed (i.e. paid workers who did not have a written contract, and the self-employed/employers who were not registered to pay tax). Hourly wages are lower for informal relative to formal workers; 1.315 log point difference at the mean. The raw differential shows the general disadvantaged position of informal workers – a result which is consistent with previous studies. To gain more insights into the wage distribution across the two types of work, *Figure 1* plots the kernel density functions of (non-zero) wages. Panel A explores the distribution of wages by work type over time while Panel B explores the wage distribution for each work type over time.

In panel A, the distribution of wages for formal workers lies to the right of informal workers' wage distribution. This is consistent in both waves indicating an inferior wage distribution for informal relative to formal workers. In panel B, we observe that both formal and the informal workers' wage distributions become less peaked in wave 2 suggesting a loss in earnings between April and June lockdowns. The peak declined more for informal workers such that the distribution for wave 2 lies further below that for wave 1. The contrasting temporal changes in the wage distribution of informal and formal workers highlight that informal workers are more vulnerable to economic shocks than formal workers.

Figure 1: Earnings distributions by sector and time (Kernel Density)

Panel A: Kernel density functions by time period

Panel B: Kernel density functions by work type
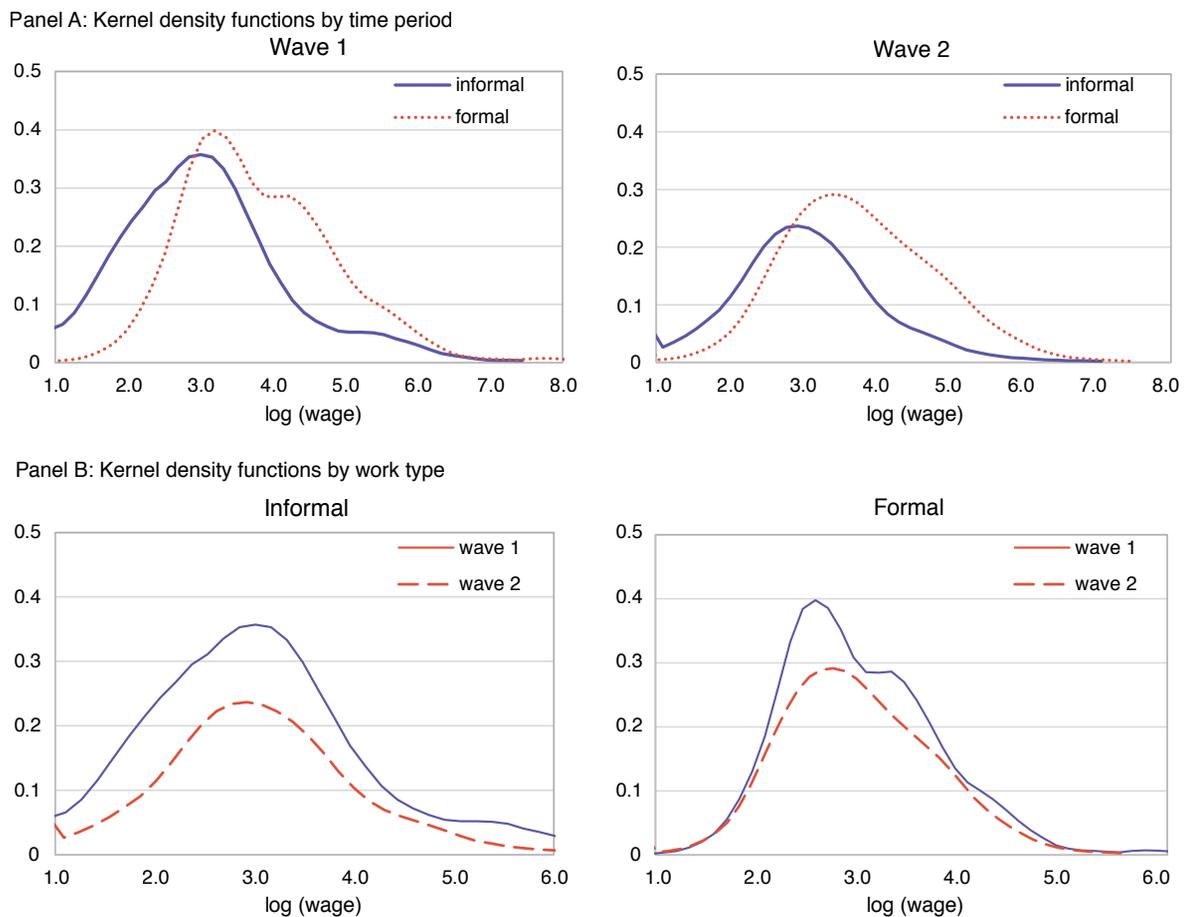
Turning to hours worked, *Table 1* shows that the amount of time spent working by informal workers is relatively lower than that of formal workers. However, we observe higher variation in the number of hours worked among informal compared to formal workers. This is consistent with the considerable heterogeneity that characterises type of work and working arrangements in the informal economy. *Figure 2* plots 'raw' changes in log wages and work hours for informal/formal workers between wave 1 and 2.

Figure 2: Changes in (log) hours and days worked
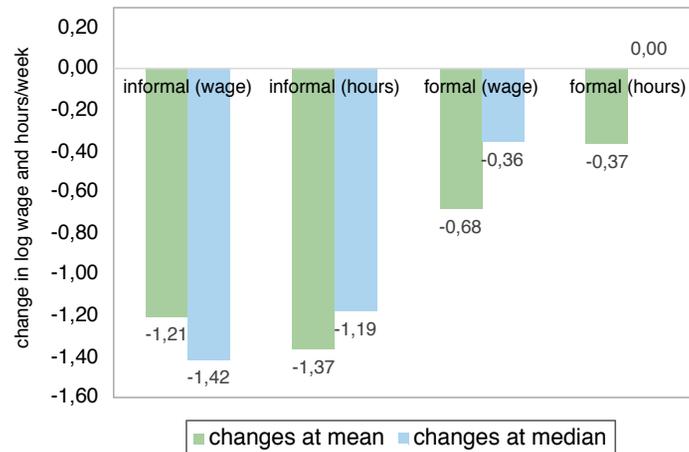
The average log wage for informal workers decreased by an average of 1.21 log points compared to 0.68 for formal workers. The higher decrease in wages among informal workers is also evident at the median where log wages for informal workers decreased by 1.42 log points compared to the 0.36 log point decline in wages of formal workers. The average number of hours worked per week by informal workers decreased by 1.37 log points compared to 0.37 log points for formal workers. At the median, we see a decrease of 1.19 log points in hours of work for informal workers while no decline is registered among formal workers. These statistics suggest that South African workers have not yet recovered from the effects of the hard lockdown.

To further characterise the informal/formal workers, *Table 2* presents descriptive statistics on demographic characteristics, education, occupation and location of workers. Informal workers are marginally older than formal workers and predominately African. The share of women in both formal and the informal work is 44%. The education distribution is skewed in favour of formal workers. Statistics also show that a higher proportion of informal workers do not have matric (58%) education compared to formal workers (31%), while the share of matriculants is 22% points higher among formal workers. The proportion of individuals with post matric education is much higher among formal workers (18% vs 44%). Further, informal workers are mainly employed as craft and related trades workers, plant and machine operators, and assemblers and are in elementary occupations. In contrast, formal workers are mainly employed as managers, professionals, technicians and clerks. This difference in job distribution is consistent with observed differences in human capital endowments between informal and formal workers.

Table 2: Descriptive statistics: Characteristics of informal/formal workers

	Overall		Formal		Informal	
	Mean	SE	Mean	SE	Mean	SE
Demographics:						
Age	37.648	(0.180)	38.191	(0.218)	36.387	(0.317)
African	0.744	(0.008)	0.695	(0.010)	0.857	(0.011)
Coloured	0.120	(0.006)	0.127	(0.007)	0.103	(0.009)
Indian/Asian	0.015	(0.002)	0.021	(0.003)	0.000	(0.000)
White	0.122	(0.006)	0.157	(0.008)	0.040	(0.006)
Female	0.437	(0.009)	0.436	(0.011)	0.440	(0.015)
Education						
No matric	0.392	(0.009)	0.308	(0.010)	0.587	(0.015)
Matric	0.244	(0.008)	0.251	(0.009)	0.229	(0.013)
Post matric	0.364	(0.009)	0.441	(0.011)	0.183	(0.012)
Location						
Urban	0.825	(0.007)	0.854	(0.008)	0.757	(0.013)
Gauteng	0.313	(0.008)	0.310	(0.010)	0.321	(0.014)
Western Cape	0.137	(0.006)	0.166	(0.008)	0.069	(0.008)
Eastern Cape	0.114	(0.006)	0.117	(0.007)	0.107	(0.009)
Northern Cape	0.035	(0.003)	0.033	(0.004)	0.039	(0.006)
Free State	0.054	(0.004)	0.053	(0.005)	0.056	(0.007)
KwaZulu Natal	0.117	(0.006)	0.105	(0.007)	0.146	(0.011)
North West	0.049	(0.004)	0.053	(0.005)	0.038	(0.006)
Mpumalanga	0.090	(0.005)	0.086	(0.006)	0.101	(0.009)
Limpopo	0.091	(0.005)	0.077	(0.006)	0.123	(0.010)
Occupation:						
Occupation group 1[*]	0.255	(0.009)	0.313	(0.011)	0.037	(0.008)
Occupation group 2[≞]	0.204	(0.008)	0.232	(0.010)	0.102	(0.012)
Occupation group 3[#]	0.181	(0.008)	0.177	(0.009)	0.199	(0.016)
Occupation group 4[°]	0.176	(0.008)	0.146	(0.008)	0.285	(0.018)
Occupation group 5[‡]	0.184	(0.008)	0.132	(0.008)	0.377	(0.020)
Wave 1	0.500	(0.009)	0.500	(0.011)	0.500	(0.015)

Notes:
1. All statistics are weighted.
2. *Occupation 1 consists of armed forces occupations, managers and professionals; ≞occupation 2 consists of technicians associate professionals and clerical support workers; #occupation 3 consists of service and sales workers and skilled agricultural, forestry and fisheries; occupation 4 consists of craft and related trades workers, plant and machine operators, and assembling and occupation 5 consists of elementary occupations.

In terms of location, 85% of formal workers are in urban areas. The corresponding figure for informal workers is 76%. This indicates that much of South Africa's workers are located in urban rather than rural areas. Gauteng has the highest share of informal workers (32%), followed by KwaZulu Natal (15%) and then Limpopo (12%). In terms of formal workers, Gauteng is also a lead employer (31%) followed by Western Cape (17%), and then Eastern Cape and KwaZulu Natal (11%). Northern Cape has the least share of both formal and informal workers (3%). Overall, there is considerable variation in terms of the share of informal workers across South Africa's provinces.

4. Results

This section presents our DID results on the changes in labour market outcomes of informal relative to formal workers during the April-June period. We also examine job loss patterns among informal and formal workers and characterise those with missing information on wages and hours of work. The latter aims to assess if workers with missing information are considerably different from those with non-missing information in a bid to understand the direction of the potential bias stemming from a non-random loss of information. We then discuss the implications of our results for policy.

4.1.   Labour market outcomes

Table 3 presents results for DID estimates. We begin by presenting the changes in wages and hours of work that occur among informal and formal workers between April wave 1 (lock down level 5 – before period) and June wave 2 (lockdown level 3 – after period with relaxed lockdown regulations). We then report the difference in differences estimate; treatment effect that captures the changes in wages and hours worked of informal relative to formal workers. Robust and clustered standard errors are presented in parentheses.

Our results show that between April and June wages among formal workers declined by 68% while the decline for informal workers was 120%. Thus, wages for informal workers further declined by 52% points compared to the decrease experienced among formal workers. This significant difference disappears when we control for differences in workers characteristics. As indicated in *Table 2*, wages did decrease in both sectors over time, however both formal and informal workers' wages generally decreased by the same margin. Given the heterogeneity characterising informal employment, it is possible that this effect is not homogenous across sub-groups. To assess this, we disaggregate our results by gender and location.

Focusing on estimates that control for observed worker heterogeneity, we find that wages for women in formal employment decreased by 59% while those for women in informal employment decreased by 93%. Comparing these temporal changes across informal and formal work reveals that the decline in wages of informally employed women is not statistically different from that experienced by their counterparts in formal work. This result is robust across model specifications suggesting that women in informal and formal work had statistically similar decreases in wages over time. Men in informal employment experienced a higher decline in wages (72%) compared to that experienced by their counterparts in formal employment. Thus, compared to experiences of informally employed women, men in informal employment suffered a higher loss in wages.

Turning to results by location, in both model specifications we find that wages declined for both informal and formal workers in the urban areas. With a larger decrease in wages registered for informal relative to formal workers. Thus, for informal workers in urban areas wages decreased by a further 80% points relative to formal workers. In contrast, there were no significant differences between informal/formal workers' wage changes in rural areas. Collectively, our results show that men and those in the urban areas who are informally employed experienced a significant decrease in wages relative to formal workers, between April and June. While informally employed women's wages decreased over time, their experiences are of the same order as those of women in formal employment.

Table 3: Estimates of informal/formal labour market outcome differentials

	Changes in wages/hours of formal workers			Changes in wages/hours of informal workers				
	Diff	SE		Diff	SE		DID	SE.
Panel A: Wages								
DID no controls								
Overall	-0.681	(0.111)	***	-1.205	(0.145)	***	-0.524	(0.182)	***
Female	-0.734	(0.179)	***	-1.025	(0.191)	***	-0.290	(0.261)	
Male	-0.633	(0.140)	***	-1.305	(0.209)	***	-0.672	(0.251)	***
Urban	-0.531	(0.122)	***	-1.323	(0.173)	***	-0.792	(0.212)	***
Rural	-1.358	(0.239)	***	-0.688	(0.251)	***	0.670	(0.346)	*
DID with controls								
Overall	-0.564	(0.108)	***	-0.551	(0.181)	***	-0.551	(0.181)	
Female	-0.590	(0.176)	***	-0.926	(0.201)	***	-0.336	(0.268)	
Male	-0.541	(0.138)	***	-0.318	(0.000)		-0.719	(0.245)	***
Urban	-0.467	(0.120)	***	-1.272	(0.174)	***	-0.805	(0.210)	***
Rural	-1.020	(0.256)	***	-0.544	(0.259)	**	0.476	(0.368)	
Panel B: Hours								
DID no controls								
Overall	-0.368	(0.071)	***	-1.369	(0.148)	***	-1.001	(0.164)	***
Female	-0.313	(0.113)	***	-1.441	(0.186)	***	-1.128	(0.217)	***
Male	-0.405	(0.090)	***	-1.298	(0.217)	***	-0.893	(0.235)	***
Urban	-0.235	(0.072)	***	-1.430	(0.182)	***	-1.195	(0.196)	***
Rural	-1.049	(0.189)	***	-1.174	(0.219)	***	-0.125	(0.289)	
DID with controls								
Overall	-0.332	(0.067)	***	-1.308	(0.150)	***	-0.975	(0.163)	
Female	-0.250	(0.103)	**	-1.388	(0.183)	***	-1.137	(0.210)	***
Male	-0.394	(0.086)	***	-1.258	(0.217)		-0.864	(0.231)	***
Urban	-0.230	(0.071)	***	-1.390	(0.184)	***	-1.160	(0.196)	***
Rural	-0.744	(0.165)	***	-1.095	(0.207)	***	-0.352	(0.264)	

Notes:
1. Covariates consists of age, age-squared, sex, race, education, urban and province dummies and occupation. Clustered and robust standard errors in parentheses. All estimations are weighted. Significance level: ***=1%, **=5%, *=10%.

Regarding hours worked, we find a statistically significant decrease in wages of informal relative to formal workers when no controls are included. After accounting for workers' observed characteristics there were no statistically significant differences in the changes in wages of informal relative to formal workers between April and June, overall.

A disaggregation by gender shows that the number of hours worked per week significantly decreased by 25% for women in formal employment while hours worked by their counterparts in informal work decreased by 139%. The corresponding DID estimate shows that the decrease in wages registered among women in informal work was disproportionately higher by 114% points compared to that of women in formal work. Men in informal work also experienced a relatively higher decline in hours worked than that experienced by their counterparts in formal work. Thus, both men and women experienced a decrease in hours worked between April and June, however, those in informal work experienced a relatively higher decrease than those in formal work. This clearly shows the vulnerability of informal work to economic shocks. An analysis by location shows that in urban areas, both informal and formal workers experienced a decline in wages, however, the decrease was much higher among informal workers. Changes in hours of work for informal and formal workers are statistically similar in rural areas.

4.2. Job loss, missing earnings and hours of work

In this section we investigate the rate of job loss between April and June. This analysis will also consider the issue of missing information on wages and hours worked with the aim of understanding if there are differences in characteristics of those with missing information by sector. If indeed there are significant differences, then our estimates could be biased. The subsequent analysis gives some insights on the direction of the potential bias. Our analysis excludes workers who moved between formal and informal employment. To understand who these workers are, we examine their characteristics. We estimate logit models to characterise movers and workers with missing wages and hours of work. *Figure 3* presents the proportion of workers employed in wave 1 who became unemployed (expanded) in wave 2.

Figure 3: Proportion of employed who became unemployed in wave 2
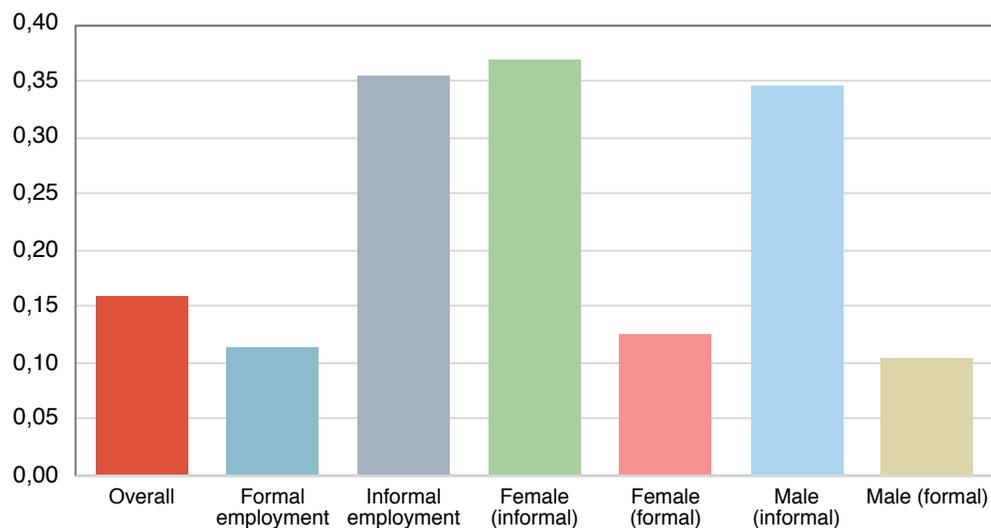
Overall, 15.8% of workers employed in wave 1 became unemployed in wave 2. The rate of job loss was considerably large among informal workers (36%) compared to those formal workers (11%). These statistics clearly show a relatively high degree of vulnerability among informal workers. Disaggregating by gender we find that 37% of women in informal employment lost their jobs between wave 1 and 2. The corresponding figure for women in formal employment is 13%. Job loss was also higher among men in informal employment (35%) compared to their counterparts in formal work (11%). Thus, informal workers experienced a higher rate of job loss regardless of gender.

Table 4: Proportion with missing wages/hours and movers

	Obs	Prop.
Missing wages	3,188	0.277
Missing hours	3,188	0.377

Notes: Unweighted observations and weighted proportion.

Also of concern is the group of workers with missing information on wages and hours worked. If individuals with missing information are considerably different from those with non-missing information, our estimates will be potentially biased. *Table 4* shows that 28% of our sample has missing information on wages while 38% have missing information on hours worked. We characterise these workers using a logit regression. Results of the analysis are presented in *Table 5*.

Table 5: Logit results – missing wages and hours

	Wages			Hours		
	Coef.	Marg. effect		Coef.	Marg. effect	
Informal	0.267	0.046	*	0.664	0.139	***
	(0.145)	(0.025)		(0.142)	(0.029)	
Age	-0.072	-0.013		-0.121	-0.025	***
	(0.045)	(0.008)		(0.048)	(0.010)	
Age-sq.	0.001	0.000	*	0.001	0.000	**
	(0.001)	(0.000)		(0.001)	(0.000)	
Female	0.183	0.032		0.235	0.049	*
	(0.138)	(0.024)		(0.131)	(0.027)	
African	1.595	0.277	***	1.710	0.359	***
	(0.332)	(0.056)		(0.300)	(0.061)	
Coloured	0.915	0.159	**	0.952	0.200	**
	(0.422)	(0.073)		(0.400)	(0.084)	
Asian/Indian	1.745	0.303	**	1.680	0.353	**
	(0.819)	(0.142)		(0.790)	(0.166)	
Matric	-0.101	-0.017		-0.380	-0.080	**
	(0.184)	(0.032)		(0.172)	(0.036)	
Post Matric	0.215	0.037		0.054	0.011	
	(0.175)	(0.030)		(0.163)	(0.034)	
Urban	0.171	0.030		-0.004	-0.001	
	(0.162)	(0.028)		(0.157)	(0.033)	
Western Cape	0.207	0.036		0.100	0.021	
	(0.330)	(0.057)		(0.314)	(0.066)	

Eastern C ape	0.255	0.044		0.360	0.076	
	(0.254)	(0.044)		(0.239)	(0.050)	
Northern Cape	0.629	0.109	*	0.576	0.121	
	(0.336)	(0.057)		(0.375)	(0.078)	
Free State	0.245	0.043		0.325	0.068	
	(0.271)	(0.047)		(0.254)	(0.053)	
KwaZulu Natal	0.215	0.037		0.172	0.036	
	(0.219)	(0.038)		(0.210)	(0.044)	
North West	0.108	0.019		-0.136	-0.029	
	(0.280)	(0.048)		(0.253)	(0.053)	
Mpumalanga	0.182	0.032		0.112	0.024	
	(0.224)	(0.039)		(0.244)	(0.051)	
Limpopo	0.601	0.104	**	0.244	0.051	
	(0.284)	(0.049)		(0.269)	(0.056)	
Wave 2	-1.444	-0.250	***	-0.425	-0.089	***
	(0.142)	(0.020)		(0.103)	(0.021)	
Constant	-1.123			0.155		
	(0.918)			(0.959)		
Pseudo R2	0.116			0.086		

Notes:
1. Dependent variable =1 if worker has missing information on wages and hours worked. Clustered and robust standard errors in parentheses. All regressions are weighted.

The results show that workers with missing wages are more likely to be in informal employment, in wave 2, African, Coloured, Asian/Indian, and situated in Northern Cape and Limpopo. For hours worked, workers with missing information are more likely to be informally employed, female, African, coloured and Asian/Indian. There is a U-shaped relationship between age and probability of not reporting hours worked. Relative to workers with no matric, those with matric are less likely to have missing hours of work. There are no significant differences in probability of having missing hours by location. Hours of work are more likely to be missing in wave 2. The Pseudo R-squared shows that 12% of the variation in the probability of not reporting wages is explained by our model. The corresponding figure for hours is 9%. The overall fit of the models is weak making the degree of bias potentially small. In case of bias, our estimates are likely to be understated as workers that do not report wages/hours are those in the vulnerable groups of the labour market. Accordingly, our results can be considered to be a lower bound and remain useful for guiding policy.

4.3.   Summary of results and Policy implications

This paper investigates changes in formal and informal workers' hourly wages and time (hours) spent at work in South Africa, from April to June. The analysis identified informal workers as regular and casual workers without an employment contract and own account workers/employers who are not registered for income/value-added tax. The analysis used a DID estimator and data from the first 2 waves of NIDS-CRAM.

The results showed that:

Hourly wages

- Overall, both formal and informal workers incurred a wage decrease from April to June. However, evidence does not show different experiences of wage loss for informal and formal workers.
- Wages for men in informal work decreased by a higher margin relative to their formal work counterparts, while women in formal and informal work had statistically similar experiences.
- Wages for informal relative to formal workers in urban areas decreased by a higher margin, and there were no statistically significant differences in wage changes for other subgroups.

Working hours

- Overall, formal and informal workers experienced statistically similar decreases in hours worked per week, however results vary by subgroup.
- Men and women in informal work experienced a higher decrease in hours worked relative to their counterparts in formal work.
- In urban areas, informal workers had a higher decrease in hours worked compared to workers in formal work. Decreases in hours worked were of the same order for informal and formal workers in rural areas.

Job loss

- The rate of job loss was higher among informal compared to formal workers regardless of gender.

Missing information

- Missing information on wages and hours worked is more likely to be in wave 2 than wave 1.
- Missing information is higher among informal compared to formal workers.
- Workers with missing information are also more likely to be female, African, Coloured and Asian.
- There are no significant differences by location in probability of having missing hours.

Given that individuals with missing information are likely to be vulnerable, our estimates are conservative.

Our results for the overall sample suggest that the decline in wages registered from April to June are not different among formal and informal workers. Hence, there is a need for government interventions that set all workers on a recovery path. Across subgroups, men and urban workers in informal work had a disproportionate decline in wages, while a negligible change occurred among informally employed women. Policies to improve wages for informal workers need to be sensitive to the heterogeneity characterising these workers. We find significantly higher decreases in hours worked among men and women in informal work relative to those in formal work. Informal workers in urban areas were more vulnerable when compared to those in rural areas. Based on these results, there is need for strategies that enable recovery of time spent at work which in turn boost productivity and wages. Social safety nets to cushion informal workers from the loss of income associated with job loss and a disproportionate decline in wages are also required. Noting the value chain linkage between formal and informal economies, concerted efforts from the government and its partners to stabilise the broader economy are essential so that informal enterprises can thrive. Due to limitations of our data, the estimated decreases in wages and hours worked are potentially underestimated.

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